01-10-03

GAU-3628

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January 7, 2003

Assistant Commissioner for Patents
United States Patent and Trademark Office
Washington, D. C. 20231
Attn: Group Art Unit 3628
USPTO Supervisor Sough

by USPS Express Mail: ET779173891US

Re: Application Number: No. 09/489,739
Filing Date: January 21, 2000
Sole Applicant/Sole Inventor: David Andrew D'Zmura (pro se independent inventor)
Attorney/Agent: None
Group Art Unit: 3628

Courtesy Communication

Dear Supervisor Sough:

Thank you for your call yesterday morning. As I clarified to you in our conversation, I faxed my Response, to the Office Communication withdrawing the improper Final Rejection, on two occasions, the first time on November 26, 2002, the second time December 13, 2002.

Pursuant to your request for me to provide you with a duplicate, courtesy copy of my faxed Response of November 26, 2002, please find the duplicate, courtesy copy contained herein, comprising eight sheets, of which the first is the cover letter dated November 26, 2002, and the remaining seven sheets being my set of claims for the up-coming re-examination. Also enclosed is a copy of the fax transmission report, confirming successful transmission, and a return receipt postcard to be returned to me documenting this USPS Express mailing.

Please let me know if you require copies of my other mailings or faxes. Thank you.

Sincerely,

David Andrew D'Zmura

enc.

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PATENT & TRADEMARK OFFICE

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November 26, 2002

Assistant Commissioner for Patents
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GROUP 3600

via Fax: (703) 305-7687

Re: Application Number: No. 09/489,739
Filing Date: January 21, 2000
Sole Applicant/Sole Inventor: David Andrew D'Zmura (pro se independent inventor)
Attorney/Agent: None
Group Art Unit: 3628
Examiner: Mr. Frantzy Poinvil

Response to Office Communication

Dear Mr. Poinvil:

Thank you for your Office Communication bearing mailing date of 11/15/02, and for our telephone conversations, during which we discussed my application, No. 09/489,739.

Please delete and cancel my claims numbered claim 1 through claim 25. Please enter my claims numbered claim 26 through claim 38: the claims numbered claim 26 through 38 are pending for your re-examination of my application. I cancel the claims numbered claim 1 through 25 without prejudice, as my new claims 26 through 38 are directed to my elected group of invention, and as I intend to pursue the non-elected groups in divisional applications. As I paid $365 in additional claim fees to my application, I do not believe I owe further fees.

I understood from you that my substitute specification and set of drawings have been entered, and that I am not required to do anything with respect to them at this juncture.

I look forward to your forthcoming re-examination of my application. Thank you.

Sincerely,

David Andrew D'Zmura

David Andrew D'Zmura (pro se independent inventor)

enc. set of claims, numbered claim 26 through claim 38

Please delete the claims numbered 1 through 25. Please enter the following new claims:

26. A set of coded algorithms, computational processing means, for valuation of a security or aggregated portfolio, providing means for mathematical valuation and sensitivity functions, comprising means for generating valuation and sensitivity data, by the Formula 1.2 or 1.2d:

$$1.2 \quad \text{Yield M} = \frac{\sum (\text{Maturity} \times \text{Portfolio Coefficient} \times \text{YTM}), \text{ for all issues}}{\sum (\text{Maturity} \times \text{Portfolio Coefficient}), \text{ for all issues;}}$$

$$1.2\text{d} \quad \text{Yield Md} = \frac{\sum (\text{Duration} \times \text{Portfolio Coefficient} \times \text{YTM}), \text{ for all issues}}{\sum (\text{Duration} \times \text{Portfolio Coefficient}), \text{ for all issues.}}$$

27. A set of coded algorithms, computational processing means, for valuation of a security or aggregated portfolio, providing means for mathematical valuation and sensitivity functions, comprising means for generating valuation and sensitivity data by Formulae S.2, S.3, and S.4:

relation of price to yield-to-maturity, in semi-annual, S.2c, or generalized form, S.2cn;

relation of change in price for change in ytm, modified annualized duration, S.3c, cn;

relation of change in the change in ytm, modified annualized convexity, S.4c, S.4cn.

28. A set of coded algorithms, computational processing means, for valuation of a security or aggregated portfolio, providing means for mathematical valuation and sensitivity functions, comprising means for generating valuation and sensitivity data by Formulae 1.3 and 1.4:

change in price for change in yield, modified annualized duration, 1.3cw and 1.3cn;

change in the change in yield, modified annualized convexity, 1.4c, 1.4cn, 1.4cvn.

29. A process for the manufacture of financial data using the endogenous variables of a financial security, useful to estimating change in the security's price given change in its yield with respect to time, which comprises implementing applicable formulation of Formula 1.1:

identifying the data values for the security's endogenous variables, of C, Y, T, per 1.1;

determining governing yield, for a single security issue, or for a portfolio of issues, or for a basket of divisible cash receipts, wherein applying processing function Formula 1.2 or 1.2d; if a security with semi-annual coupon receipts, utilizing its yield-to-maturity, which further comprises calculating yield-to-maturity per the Formula S.1 or the Formula S.2;

determining arbitrage spreads between Yield M and spot, and Yield M and YTM;

calculating the security's price, utilizing the security's values of C, Yield M, and T; if it is fixed-income by solving price, means for performing either S.1 or S.2, or both separately

determining measures of the security's pricing sensitivities, duration and convexity, duration per the Formula S.3 or 1.3, and convexity per the Formula S.4 or 1.4, respectively.

30. A method for valuing a security by its endogenous variables, comprising steps of:

identifying the data values for the security's endogenous variables, of C, Y, T, per 1.1;

establishing Yield M, means for performing process 1.2, or using spot or quote values;

utilizing values of C, Yield M, T, calculating the security's price, if it is fixed-income:

by solving price, means for performing either S.1 or S.2, or both separately;

utilizing values of C, Yield M, T, calculating duration and convexity price sensitivity:

by solving duration, means for performing S.3 or 1.3, respective S.1 or S.2;

by solving convexity, means for performing S.4 or 1.4, respective S.1 or S.2.

31. A method for valuing a financial portfolio, containing more than one divisible issue, by singular portfolio (P) data values of endogenous variables C^P, Y^P, T^P, comprising steps of:

identifying the data values for each issue's endogenous variables of C, Y, T, per 1.1;

generating the portfolio coefficients for each issue in portfolio, by:

1.5 Portfolio Coefficient, per each Issue = Present Value^I/Present Value^P;

1.5a Present Value^I = (AI + (Bid Price×Face Value)), per Issue (I);

1.5b Present Value^P = Σ (AI+(Bid Price×Face Value), for all Issues;

generating aggregate portfolio (P) data relating portfolio's value, by:

1.6a Present Value^P = Σ (AI + (Bid Price × Face Value), for all Issues;

1.6b Accrued Interest^P = Σ Accrued Interest, AI, for all Issues;

1.6c Face Value^P = Σ Face Value, for all Issues;

1.6d Implied Price^P = (Present Value^P – AI^P)/ Σ Face Value for all Issues;

generating aggregate portfolio (P) data relating portfolio's variables:

1.7a C^P = Cash Flow^P = Σ C × Portfolio Coefficient, for all Issues;

1.7b T^P = Time^P = Σ Maturity × Portfolio Coefficient, for all Issues;

1.7c Y^P = Yield^P = Σ Yield × Portfolio Coefficient, for all Issues;

if for a portfolio of U. S. Treasury issues, C^P, Y^P, T^P are:

1.8a C^P = Coupon^P = Σ Coupon × Portfolio Coefficient, for all Issues;

1.8b T^P = Maturity^P = Σ Maturity × Portfolio Coefficient, for all Issues;

1.8c Y^P = Yield^P = Σ Yield × Portfolio Coefficient, for all Issues

wherein Yield by Yield M, by zero spot for T, or by YTM of S.1 or S.2;

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processing C, Y, T, per issue, portfolio's duration and convexity:

1.9a Duration^P = Σ Duration $\times$ Portfolio Coefficient, for all Issues;

1.9b Convexity^P = Σ Convexity $\times$ Portfolio Coefficient, for all Issues.

or utilizing portfolio values, C^P, Y^P, T^P, calculating

Duration, means for performing S.3 or 1.3, respective S.1 or S.2;

Convexity, means for performing S.4 or 1.4, respective S.1 or S.2;

establishing Yield M, means for performing process 1.2, or using spot or quote Y.

32. A method for estimating change in price of a security, or of an aggregated portfolio, respective change in yield, instantaneous or as occurring over time, comprising steps of:

utilizing data values of said security's Yield M, Duration K, and Convexity V, which compute by the coded mathematical programming functions of the Formulae 1.2, 1.3 and 1.4;

identifying change in said Yield M data value at instant or as occurring over time;

determining the change in price of the security given said change in said Yield M by implementing factorization, wherein utilizing K for duration, Δ Price, due to Duration (K):

1.10k A Δ Price, due to Duration (K) = K $\times$ Δ Y;

determining the change in price of the security given said change in said Yield M by implementing factorization, wherein utilizing V for convexity, Δ Price, due to Convexity (V):

1.10v B Δ Price, due to Convexity (V) = ½ $\times$ V $\times$ $(\Delta Y)^2$;

summing the values determined by 1.10k and 1.10v, A+B, Δ Price, due to K and V:

1.10 $$\Delta \text{Price} = (K \times \delta Y) + (½ \times V \times (\delta Y)^2);$$

determining arbitrage spread of computed Δ Price versus actual notched Δ Price.

33. The method of claim 32, which further comprises an universal factorization:

1.11 $$\Delta \text{ Price} = (-\ |\text{Duration}|\ \times\ \delta Y) + (\ \tfrac{1}{2}\ \times\ \text{Convexity}\ \times\ (\delta Y\ )^2\ )\ ;$$

wherein $\delta Y \cong \Delta Y \doteq \Delta$Yield M or ΔYTM of S.2, or ΔYTM of S.1,

Duration $\doteq$ Formula 1.3, or S.3, and Convexity $\doteq$ Formula 1.4, or S.4.

34. The method of claim 32, which further comprises adding a derivative respecting time, and further comprises adding any accrued interest, wherein using dirty price within A and B:

1.111 $$\Delta P = A + B + C + D$$

wherein,

$\Delta P \doteq$ change in bid price, for given changes in yield and time,

$A \doteq$ -abs(Duration) $\times$ Price(dirty) $\times\ \Delta Y$

$B = \tfrac{1}{2} \times$ Convexity $\times$ Price(dirty) $\times\ (\Delta Y)^2$

$C \doteq$ Theta $\times$ Price(dirty) $\times\ \Delta t$

$D \doteq$ -(Δ Accrued Interest, for given Δt),

and wherein,

Y (YTM), by Formula S.1, or Formula S.2 or Formula 1.2,

Duration and Convexity, Formulae S.3 or 1.3, and S.4 or 1.4,

Theta (θ), such a theta: $\theta \doteq 2\ \ln(1+r/2)$, $r \doteq$ ytm,

Price (dirty) equals bid price plus accumulated interest,

Δt is elapsed time between two points whereby estimations are made,

ΔP rounded to nearest pricing gradient, ΔP occurring Δt, determining arbitrage spread of computed Δ Price versus actual notched Δ Price.

35. An apparatus, generating financial data, an analytic valuation engine, comprising:

means to input values from a data-feed, stored memory or by simulation, for a security, or for securities in a portfolio, with respect to endogenous variables C, Y and T;

means calculating the governing yield, the Yield M, for the security or for portfolio, applying coded algorithms of Formulae 1, sending calculated value(s) to the arbitrage engine, together with the security's market yield values determined by Formula S.1 and Formula S.2;

means sending governing yield value and the market yield values to processing, wherein Yield M data, computing duration and convexity (and theta) data per Formulae 1.3, 1.4 (1.111), and wherein per market yield data, duration and convexity (and theta) data, by Formula S.1 per Formulae S.3, S.4 (1.111), and by Formula S.2 per Formulae 1.3, 1.4 (1.111);

means sending the governing yield, and its convexity, duration (and theta), data set to data storage, and means computing factorization per Formula 1.10 (1.111), whereas sending market yield data to storage and means computing factorization per Formula S.5 (or 1.111);

means to tabling, charting and rendering said generated data of security or portfolio.

36. An apparatus, processing data or transaction, automated arbitrage engine, comprising:

means to input data from storage or data-stream of analytic valuation engine, said apparatus updating market pricing and market yield of security and from real-time data-feed;

means computing an arbitrage differential between market yield and governing yield;

means computing an arbitrage differential between precise price change and actual;

means adjusting said differentials by transaction costs or market bid and ask pricing;

means sorting arbitrage opportunities of securities by profit, spread or notch premium.

37. An integrated computer-based financial information and transaction processing system providing analytic processing, assessment of arbitrage spreads and execution of transactions, comprising:

business logic computational engines of two core server-based systems: an analytic valuation engine; and an automated arbitrage engine;

real-time financial data-feed, wherein each of the core business logic servers receiving market pricing data through said data-feed, wherein the signal data (i.e. for analytic valuation: of security typus, credit rating, C, T, P) are delivered to cores for computational processing;

porting connections between core business logic engines and from each engine to output, rendering and storage devices, such devices include printers, terminals and memory;

automated control sequences to providing execution of computer-driven transactions;

tele-communications connections between system comprised of engines and external entities, such entities include the group of exchanges, broker/dealers, and investment entities;

protective devices, such include the group of encryption, gate-keepers and firewalls.

38. A method of mutual fund operation, such fund a ladder-based U.S. Treasury portfolio, containing U.S. Notes and Bonds spanning the short and medium terms, comprising steps of:

running the ladder, sequentially reinvesting matured issues at end of portfolio tenures;

managing the fund to enhancing fund return by operation of the system of claim 37.

Prepared by David Andrew D'Zmura